

Kit's Computing Quest: The Algorithm Adventure

Learning objective: To understand, design, and sequence algorithms to solve a specific problem.

Kit the fox is trying to build a robot to help him organize his library. An algorithm is a precise set of instructions to complete a task. Look at the list of steps below for making a cup of tea for a guest. Some are missing, and some are in the wrong order! Re-order the steps numbered 1 to 8 so that the sequence is logical and safe. Then, identify one step that could be broken down into a 'sub-routine' (a smaller set of instructions).

Word bank: Sequence · Algorithm · Sub-routine · Input · Output · Debug · Process

1. The scrambled steps are: A) Add the tea bag to the mug. B) Pour the hot water into the mug. C) Place the mug on the counter. D) Stir the tea with a spoon. E) Remove the tea bag. F) Boil the kettle. G) Add a splash of milk. H) Turn on the kettle. Write the correct sequence (1-8) in the correct order. (4 marks)

2. If the kettle doesn't turn on, Kit says he needs to 'debug' his algorithm. What does 'debug' mean in this context? (2 marks)

3. Which step in the process above would you turn into a 'sub-routine'? Explain why breaking this step down into smaller instructions helps a computer follow it better. (3 marks)

4. If Kit wanted to sell cups of tea in his library for £1.50 each, how would you update the algorithm to include a 'decision' (e.g., IF the customer pays, THEN make the tea)? (2 marks)

5. Why must an algorithm have a clear start and end point? (2 marks)

Draw: Draw a flow chart showing the process of 'Making a cup of tea'. Use boxes for the steps and arrows to show the direction of the flow.



Extension challenge: Imagine Kit wants the robot to serve exactly 5 customers. Write a 'loop' instruction that tells the robot to repeat the tea-making process until 5 cups have been served.